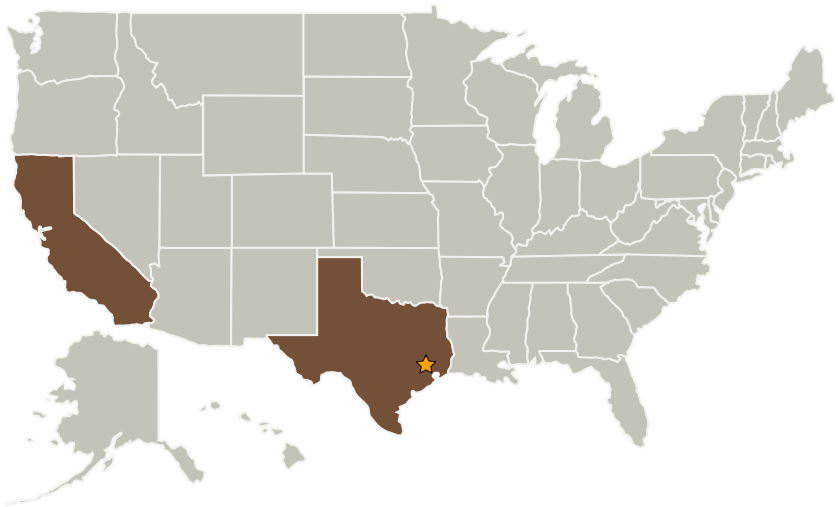
Flash 3D Rendezvous and Docking Sensor, Phase II

Completed Technology Project (2009 - 2010)

Project Introduction

With NASA's exploration initiative to return to Lunar Exploration and eventual human exploration of Mars, NASA has an increased need for an Autonomous Rendezvous and Docking (AR&D) solution. First generation rendezvous sensors used video guidance and required extensive human intervention and ground control. Data latency in these systems is problematic and has uncovered the need for an autonomous rendezvous and docking system. Scanning Ladar and stereo video have significant shortcoming and have not proven they can provide a solution to reduce the reliance on human interaction during proximity operations. ASC's Flash Ladar video cameras can provide the 6 Degree-of-freedom data in real time, not available in any other video system. Advanced Scientific Concepts Inc. (ASC) is a small business that has developed a number of 3D flash LADAR systems. Flash Ladar Video Cameras (FLVC) are 3D vision systems that return range and intensity information for each pixel in real time. The ASC camera with its 128x128 3D array is the equivalent of 16000 range finders on one chip. This allows the sensor to act as a 3D video camera with functionality well beyond just range finding. Its small size, low power and fast range data frame rate (30Hz) allows the sensor to be configured for a variety of rendezvous and proximity missions.

Primary U.S. Work Locations and Key Partners



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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Johnson Space Center (JSC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
★Johnson Space Center(JSC)	Lead Organization	NASA Center	Houston, Texas
Advanced Scientific Concepts, Inc.	Supporting Organization	Industry	Goleta, California

Primary U.S. Work Locations	
California	Texas

Project Transitions

February 2009: Project Start

August 2010: Closed out

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Technology Areas

Primary:

- TX04 Robotic Systems
  - TX04.5 Autonomous Rendezvous and Docking
    - TX04.5.1 Relative Navigation Sensors